Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

MIS027-06 Room:201A Time:May 22 15:30-15:45

Soil properties of sea-bottom sediments in the Eastern Margin of Japan Sea

Satsuki Kataoka[1*], Satoshi Yamashita[2], Takayuki Kawaguchi[1], Ryo Matsumoto[3]

[1]Hakodate National College of Technology, [2]Kitami Institute of Technology, [3]University of Tokyo

Gas hydrates are attracting attention as a next-generation energy source. On the other hands, Methane gas contained in the natural gas hydrates has approximately 20 times the greenhouse effect of CO_2. There are concerns that dissociation of methane gas from the gas hydrates distributed in submarine surface layers (shallow type gas hydrates) by rising ocean temperatures or by vaporization at recovery of the hydrates for energy may contribute to global warming, which in turn may raise the sea level and causing climatic instability. In addition, many gas-hydrate-bearing areas are distributed near the boundaries of tectonic plates, as shown in the figure. Gas hydrates in the surface layer of seafloor may dissociate when seismic activities cause seafloor landslides that in turn cause gas hydrate-bearing layers to fail. There have been concerns over the environmental effects of shallow type gas hydrates, but surveys for shallow type hydrates have been few.

In this study, we clarify the similarities and differences in physical and mechanical properties of sediments with and without gas hydrates by conducting various physical and mechanical tests on gas hydrate-bearing sediments recovered from Eastern Margin of Japan Sea. Changes in mechanical properties associated with the disturbance of the sediment sample recovered from the gas hydrate-bearing ground will be clarified.

Test results showed that the strength of sediments contained with gas hydrates were lower than those of standard sea-bottom sediments. It would seem that this is because the effect of the disturbance of sedimentary layers by gas and water upwelling from underground and the pressure release during the sampling. Accordingly, it is considered that the gas hydrate-bearing ground is unstable compared with other ground.

This study is supported by MH21, Research Consortium for Methane Hydrate Resources in Japan.

Keywords: Sea-bottom sediment, mechanical properties, gas hydrate